

Lab: Intro to Java

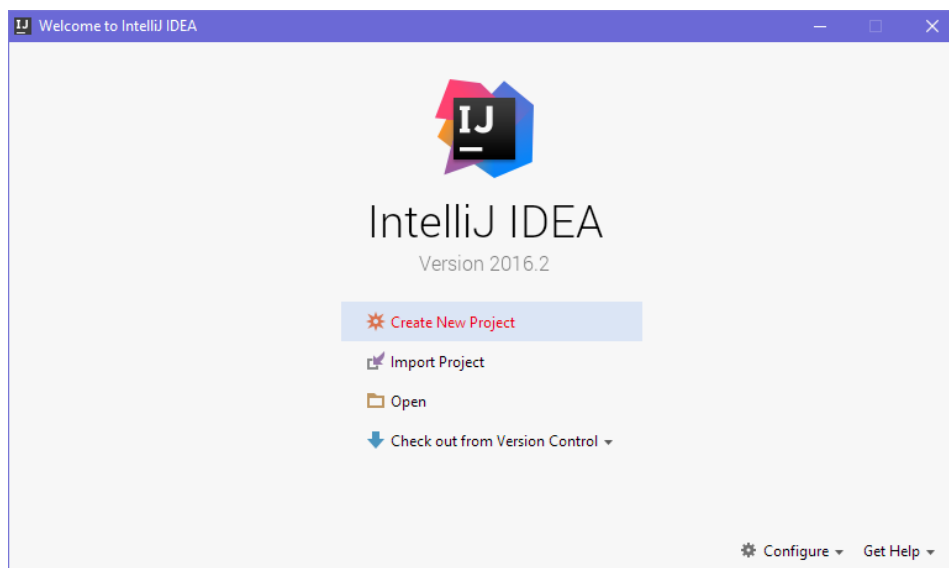
This document defines the exercises for ["Java Advanced" course @ Software University](#). Please submit your solutions (source code) of all below described problems in [Judge](#).

I. I/O and Data Types

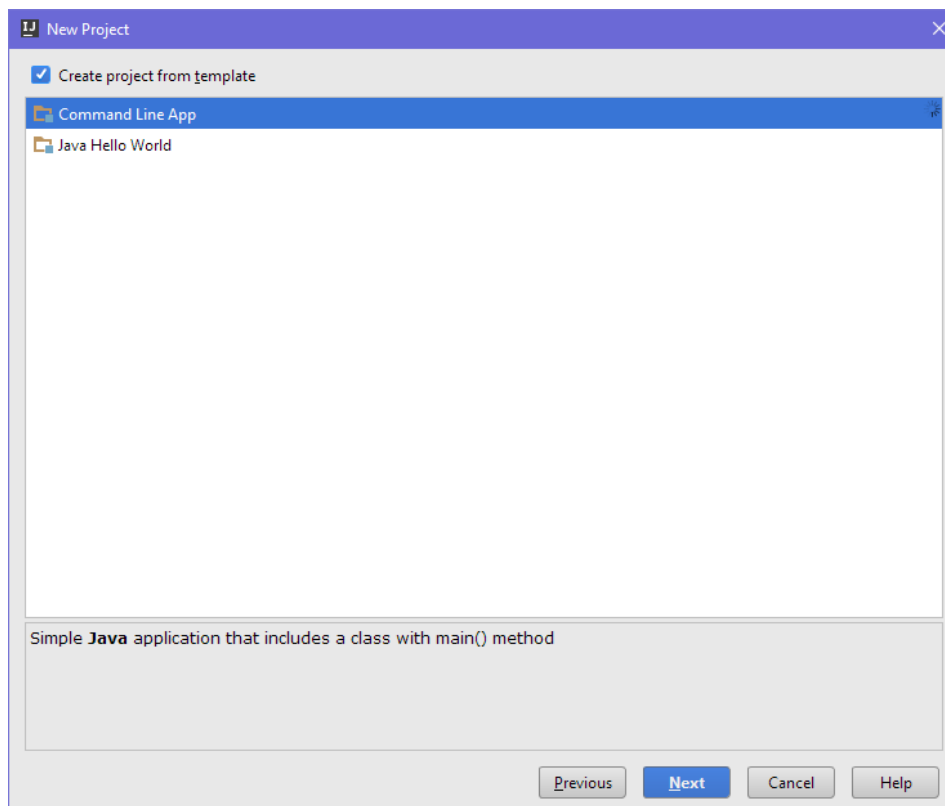
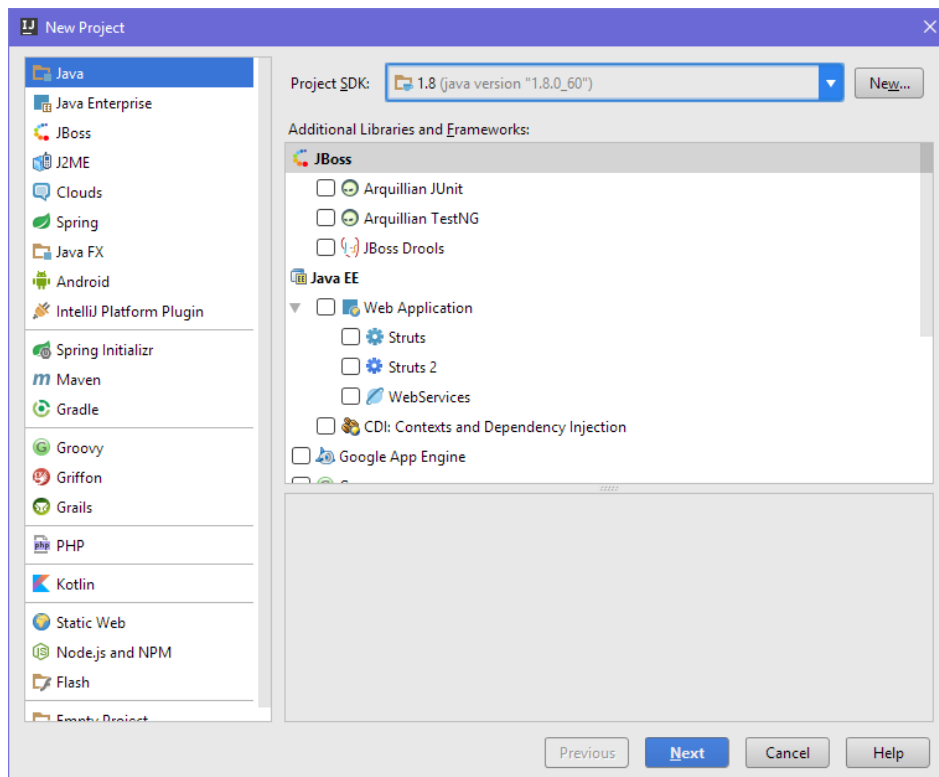
1. Program "Hello Java"

Write a console Java program, which prints "Hello Java".

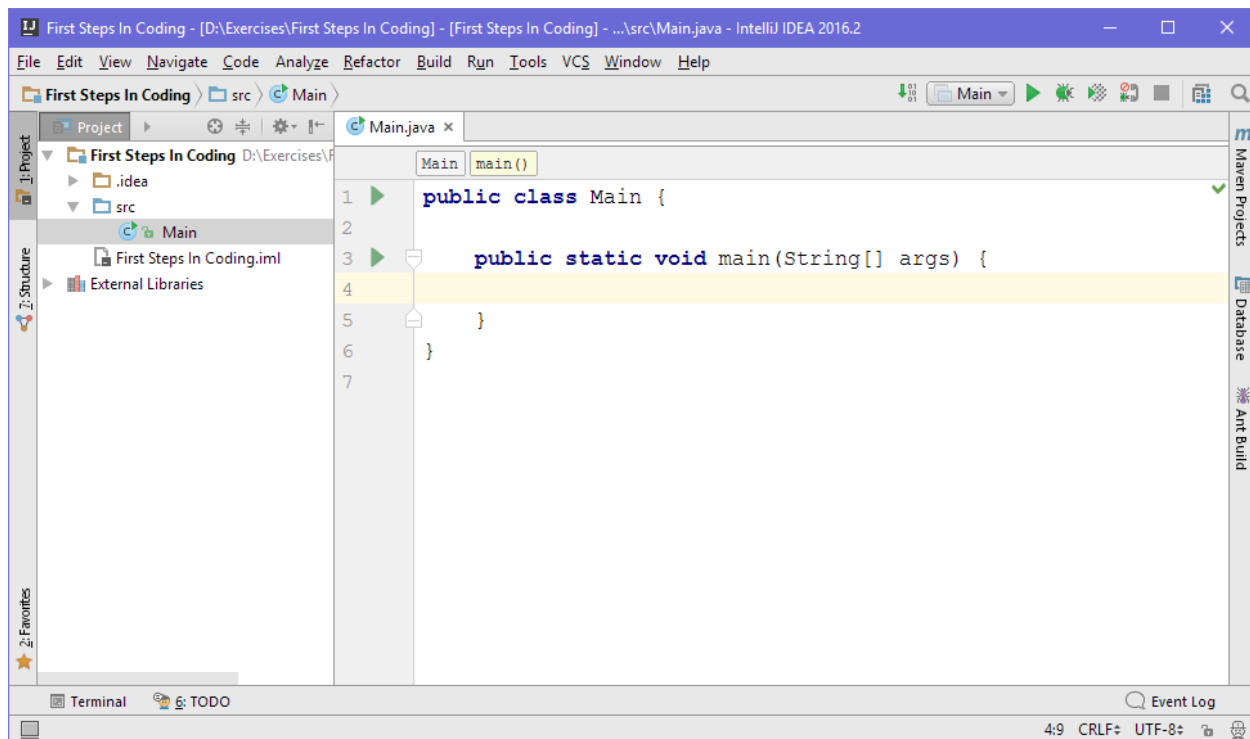
1. Start IntelliJ IDEA.
2. Create new project: [Create New Project].



3. Choose [Java] → [Windows] → [Console Application] and give the project an appropriate name like "HelloJava":



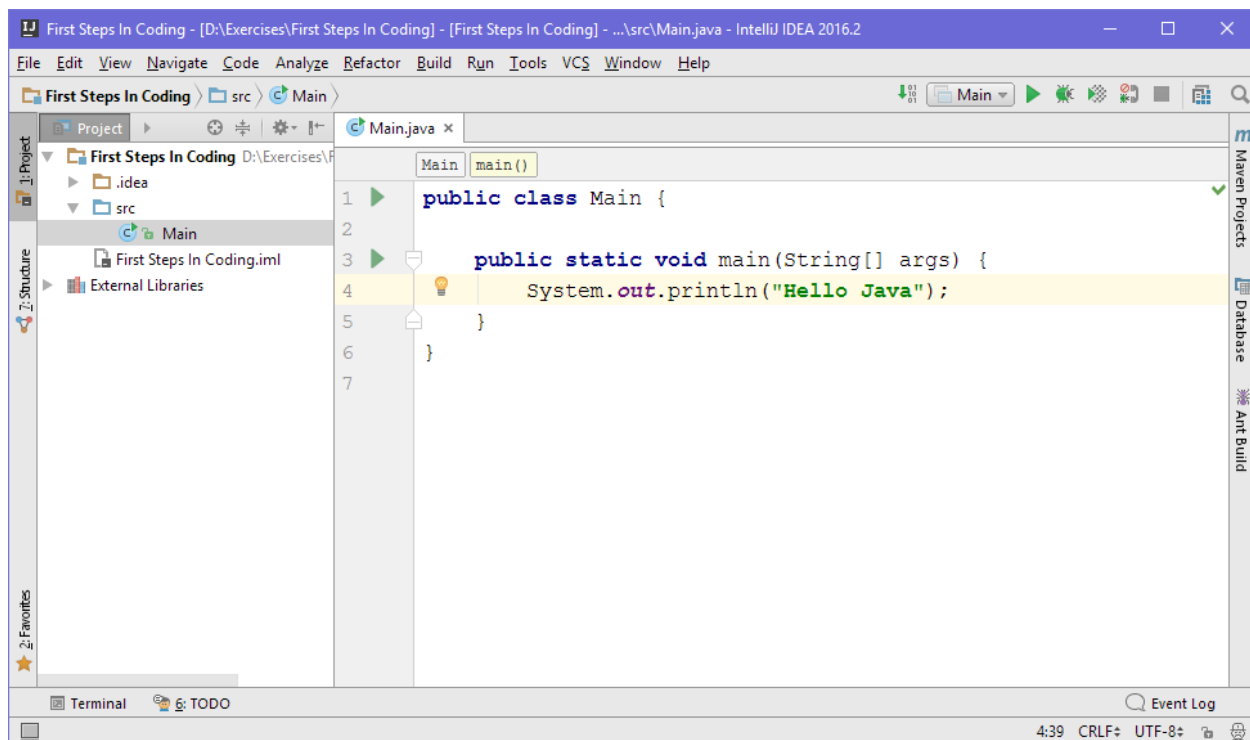
4. Find section `main(String[] args)`. Write your Java statements there.
5. Place your cursor between the opening and closing brackets `{ }`.
6. Press **[Enter]** after the opening bracket `{`.



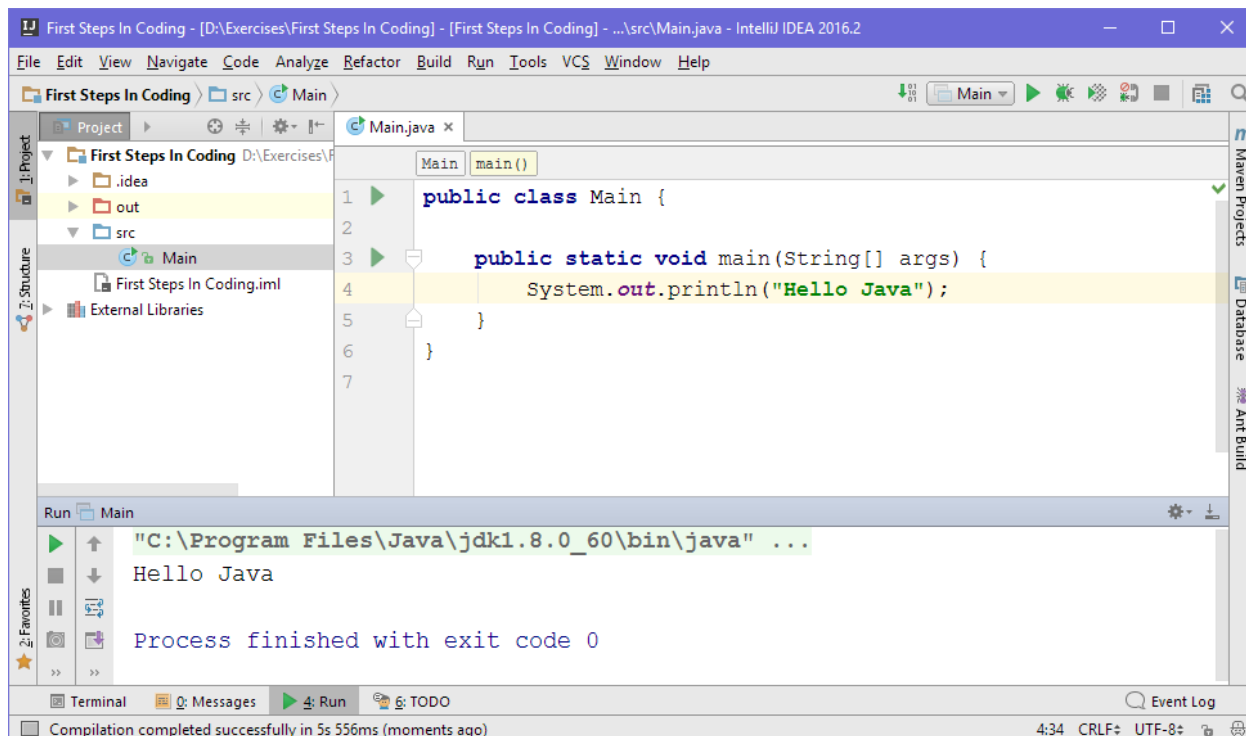
7. Write your statements (command for printing "Hello Java"):

```
System.out.println("Hello Java");
```

The code should be indented by a single tab.



8. Start the program by pressing **[Ctrl+Shift+F10]**. You should get the following result:



2. Read Input

Write a program that reads:

- **Two strings** from the first line
- **Three Integers** which may be on multiple lines
- A **string** from the next line

Print the output in the following format **{firstWord} {secondWord} {thirdWord} {sumOfNumbers}**.

The sum of numbers should be an integer.

Examples

Input	Output
Java Rocks 5 12 -7 End	Java Rocks End 10
scanner system 1 2 3 in	scanner system in 6

Hints

- Use the Scanner class
- Use the methods `next()`, `nextInt()`, `nextLine()`

Solution

You might help yourself with the code below:

```

Scanner input = new Scanner(System.in);
String firstWord = input.next("\\w+");
String secondWord = input.next("\\w+");
int firstInt = input.nextInt();
int secondInt = input.nextInt();
int thirdInt = input.nextInt();
input.nextLine(); // Skip to the line end
String thirdWord = input.nextLine();

int sum = firstInt + secondInt + thirdInt;

System.out.println(firstWord + " " + secondWord + " " + thirdWord + " " + sum);

```

3. Average of Three Numbers

Write program that **reads three numbers**. Print the **average of the three**, formatted to the **second digit after the decimal point**.

Examples

Input	Output
2 4.5 3	3.17
3.1 4 15	7.37

Hints

- You might use Scanner class
- To read the next double use the method **nextDouble()**:

```
double first = sc.nextDouble();
```

4. Euro Trip

You need to calculate the price of a given quantity of "wurst" in Deutsche Marks. Read the quantity as a double value and print the price in marks, given the following:

- The price of 1 kg wurst is 1.20 BGN
- The exchange rate is 4210500000000 DM : 1 BGN

Print the price, **rounded to the second digit** after the decimal separator.

Examples

Input	Output
2.35	11873610000000.00 marks
1	5052600000000.00 marks
15	75789000000000.00 marks

Hints

- Use the BigDecimal class to handle calculations involving money
- Don't forget to format the output by using the method of the System class **printf()**.

5. Greeting

Read two strings as an input – the first and last name of a person. Print a greeting in the following format: "Hello, " + {firstName} {lastName} + "!", where if a name is missing, replace it with five stars "*":

Examples

Input	Output
Robert Ford	Hello, Robert Ford!
Ford	Hello, ***** Ford!

Hints

- Use the Scanner method `nextLine()`
- Use the String static method `isEmpty()` as in the example below:

```
if (firstName.isEmpty()) {  
    firstName = "*****";  
}
```

II. Conditional Statements and Loops

6. Transport Price

A student travels **n** kilometers using only **one type of transport** based on the **distance that he will travel**:

- **Taxi**: Initial tax: **0.70 USD**. Daytime cost: **0.79 USD/km**. Night time cost: **0.90 USD/km**.
- **Bus**: Day / Night tariff: **0.09 USD/km**. For **at least 20 kilometers**.
- **Train**: Day / Night tariff: **0.06 USD/km**. For **at least 100 kilometers**.

Write a program that calculates the price of the trip by a given distance and time of day.

Format the output to the second digit after the decimal separator.

Examples

Input	Output
5 day	4.65
7 night	7.00
25 day	2.25
180 night	10.80

7. Numbers 0..9

Using a **while loop**, print the numbers from 0 to 9 inclusive.

Examples

Input	Output
	Number: 0
	Number: 1
	Number: 2
	Number: 3
	Number: 4
	Number: 5
	Number: 6
	Number: 7
	Number: 8
	Number: 9

8. Product of Numbers [N..M]

Write a program that calculates the product of all numbers in the interval [n..m] by given **n** and **m**:

Examples

Input	Output
1 5	product[1..5] = 120
3 20	product[3..20] = 1216451004088320000

Hints

- Use the **BigInteger** class to handle big numbers and a do-while loop.

9. Lottery

Print all combinations from TOTO 3/10 lottery (like 6/49 but with less combinations):

Examples

Input	Output
	...
	...
	7 8 10
	7 9 10
	8 9 10

Hints

- Use 3 nested loops.

III. Bitwise Operations

10. Extract Bit from Integer

Write a program that extracts from given positive integer **n** the value of given **bit at index p**. The bits are counted from **right to left**, starting from bit 0.

Examples

Input	Output	Comments
5 2	1	n=5, p=2 binary representation of 5 : 00000000 00000 1 01
0 9	0	n=0, p=9 binary representation of 0 : 0000000 0 00000000

11. Modify a Bit

We are given a positive integer number **n**, a position **p** and a bit value **v** (**v=0** or **1**). Write a program that modifies **n** to hold the value **v** at the position **p** from the binary representation of **n** while preserving all other bits in **n**.

Print the decimal representation of the resulting number.

Examples

Input	Output	Comments
5 2 0	1	n=5, p=2, v=0 binary representation of 5 : 00000000 00000 1 01 binary representation of the result (1): 00000000 00000 0 01
0 9 1	512	n=0, p=9, v=1 binary representation of 0 : 0000000 0 00000000 binary representation of the result (512): 0000000 1 0 00000000